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1 **SYSTEM AND METHOD FOR AUTOMATED CREDIT MATCHING**

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11 **II. FIELD OF THE INVENTION**

12 This invention relates to system and method for credit matching, especially in
13 facilitating eCommerce transactions.

14 **III. BACKGROUND OF THE INVENTION**

15 Electronic commerce ("eCommerce") has proliferated over the Internet recently.
16 One difficulty in eCommerce is handling payment processes. Presently, in
17 Business-to-Consumer ("B2C") eCommerce, credit card payment and debit
18 settlement are common methods of payment where the price of goods or services
19 are relatively low. Business-to-Business ("B2B") eCommerce and some high dollar
20 transactions in the B2C eCommerce, e.g., cars or furniture, however, can involve
21 significantly higher dollar transactions than in the lower dollar B2C eCommerce.
22 Thus, in those cases credit card payments and debit settlements are often
23 inappropriate or unavailable. To date, the payment and credit mechanisms utilized
24 in B2B eCommerce transactions have followed the same model as with non-

1 eCommerce transactions. That is, to extend credit the seller evaluates the buyers
2 credit rating and offers from zero or several credit offerings.

3 The buyer either then selects one credit offering from the seller or obtains a loan
4 from a third-party lender. Traditionally, large sellers only sell to large buyers in bulk
5 with no little or no credit extension. Thus, small buyers' offers to buy small quantities
6 from large sellers are typically rejected by the large seller. This is often because the
7 small buyer requires credit and the large seller does not wish to extend credit since it
8 would result in carrying accounts receivable for numerous small buyers. All of this
9 credit offering determination and selection is manpower and time intensive, thus
10 greatly slowing the speed of the transaction. Also, if the buyer is not satisfied with
11 the credit offerings of the seller, the buyer has little or no choice to easily, quickly,
12 and conveniently secure other credit options.

13 Accordingly, there is a need for an automated credit evaluation, automated credit
14 terms matching, and automated buyer selection and offering acceptance process
15 which better matches the Internet's faster transaction capabilities and otherwise
16 overcomes the above-described deficiencies. The method and system of the
17 invention described herein provides such a solution.

18 IV. SUMMARY OF THE INVENTION

19 The invention includes a method of financing eCommerce purchases including:
20 receiving over the Internet buyer registration information. Then evaluating a credit
21 rating for the buyer and passing over the Internet the credit rating to a seller, and
22 then receiving over the Internet from the seller seller's credit options for the buyer.
23 The next steps are determining other credit provider's credit options for the buyer,
24 creating a database of the credit options for the buyer. After receiving over the
25 Internet an order for the buyer, then querying the database with query criteria
26 specific to the order, thereby resulting in a report of credit options for the buyer for
27 the order. Passing over the Internet the report to the buyer; receiving over the
28 Internet the buyer's selection of a credit option; passing over the Internet a payment

1 schedule for the buyer to an intermediary; and receiving payment remitted from the
2 buyer.

3 In another embodiment, the invention includes a method of financing eCommerce
4 purchases including: evaluating a credit rating for the buyer, passing the credit rating
5 to a seller, receiving from the seller seller's credit options for the buyer, determining
6 other credit provider's credit options for the buyer, creating a database combining all
7 of the credit options for the buyer, retrieving from the database a report of credit
8 options for the buyer, passing the report to the buyer, entering a credit agreement
9 with the buyer for at least one of the credit options, passing funds borrowed pursuant
10 to the credit agreement to the buyer or the buyer's designated recipient; and
11 receiving funds from the buyer in repayment of the borrowed funds pursuant to the
12 credit agreement.

13 In another embodiment, the invention includes a memory for storing data for access
14 by an application program being executed on a data processing system, including a
15 buyer relation; a seller relation; an order relation; a credit provider relation; a credit
16 terms relation; and a products relation; and wherein the attributes of said relations
17 are selected such that such relations form a relational database.

18 In other embodiments the invention includes systems configured and adapted to
19 perform the steps listed in the above-described methods, and computer readable
20 media containing computer readable instructions configured and adapted to perform
21 the steps listed in the above-described methods.

22 These and other features and advantages of the present invention will be made
23 more apparent through a consideration of the following detailed description of a
24 preferred embodiment of the invention. In the course of this description, frequent
25 reference will be made to the attached drawings.

V. BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic diagram combining aspects of a conceptual data model / entity-relationship diagram and data flow diagram showing the key components of one embodiment of the invention and their interrelationships.

FIG. 2 is an alternate entity-relationship diagram showing the key components of one embodiment of the invention and their interrelationships.

FIG. 3 is a schematic block system level 0 flow chart diagram of one embodiment of the invention.

FIG. 4 is a schematic level 1 data flow diagram (a first decomposition of the system diagram in Fig. 3) and shows logical data flow between major processes of one embodiment of the invention.

Fig. 5 is an example in one embodiment of relations for use in a credit option database. By way of background, databases require a consistent structure, termed a schema, to organize and manage the information. In a relational database, the schema is a collection of tables. For each table, there is generally one schema to which it belongs. In an implementation of a relational database, a relation corresponds to a table having rows, where each row corresponds to a record (or tuple), and columns, where each column corresponds to a field (or attribute). From a practical standpoint, rows represent records of related data and columns identify individual data elements.

Fig. 6A-6B illustrate in one embodiment sample SQL-type database queries for matching credit options for a buyer.

Figs. 7-9 depicts in one embodiment various schematic diagrams of the exemplary logical process involved in credit matching for various scenarios.

VI. DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

The major components (also interchangeably called aspects, subsystems, modules, functions, services) of the system and method of the invention, and examples of advantages they provide, are described below with reference to the figures. For figures including process/means blocks, each block, separately or in combination, is alternatively computer implemented, computer assisted, and/or human implemented. Computer implementation optionally includes one or more conventional general purpose computers having a processor, memory, storage, input devices, output devices and/or conventional networking devices, protocols, and/or conventional client-server hardware and software. Where any block or combination of blocks is computer implemented, it is done optionally by conventional means, whereby one skilled in the art of computer implementation could utilize conventional algorithms, components, and devices to implement the requirements and design of the invention provided herein. However, the invention also includes any new, unconventional implementation means.

FIG. 1 is a schematic diagram combining aspects of a conceptual data model / entity-relationship diagram and a data flow diagram. It shows the key entities of one embodiment of the invention and their interrelationships and key messages transferring between the entities in the practice of the process and system of the invention. Transaction Facilitator ("TF") 120 optionally provides financing services to multiple buyers 110, multiple sellers 115, multiple eMarket Places, and obtains services from multiple credit evaluators 125. Note that a party could play multiple rolls in the process at different times or at the same time. For example, a party could be both a buyer of goods and a seller of goods. Buyer 110 register with, passes credit option selections, and remits payments to TF 120. TF creates credit profile for, and passes credit options for a particular order to, buyer 110. Buyer then accepts a credit offering from TF. TF closes the financial order loop between buyer, seller, credit provider and TF. TF initiates financial transactions based on accepted credit terms.

1 One embodiment of a eCommerce financing method/process according to the
2 invention with the entities shown in Fig. 1 is as follows. Buyer 110 registers with
3 transaction facilitator 120. Registration includes: buyer's identification of sellers from
4 which buyer contemplates doing business; general business and financial
5 information needed to facilitate credit evaluation by TF (e.g., financial statements) or
6 seller (including existing credit enhancements from external providers); and credit
7 needs and preferences for those suppliers previously indicated.

8 Registration information of buyer 110 is processed through credit evaluator to
9 produce proprietary credit profile. The credit profile is passed with registration
10 information and/or proprietary credit profile to anticipated sellers 115-specified by
11 buyer. Seller 115 registers approved credit limit and terms for each buyer and/or
12 buyer profile with transaction facilitator.

13 Buyer 110 initiates purchase request with Market Place exchange 105. Market Place
14 Exchange passes purchase request to transaction facilitator 120. Transaction
15 facilitator 120 determines payment terms options based on approved credit limits
16 and terms offered by sellers. Transaction facilitator 120 passes sellers' purchase
17 approval and sellers' approved payment terms options, as well as TF and other 3rd
18 party credit extension, if any, to buyer.

19 Transaction facilitator 120 passes other credit offerings to buyer; these may include,
20 e.g., additional capacity to buy, longer payment terms for revolving credit. Buyer
21 110 indicates acceptance or rejection of terms offered by the supplier or by the
22 transaction facilitator. Transaction facilitator 120 notifies Market Exchange 105 of
23 buyers 110 acceptance and selected payment method. Market Exchange 105
24 advises transaction facilitator as to when events occur that trigger dates required to
25 schedule payment (e.g., ship date).

26 Transaction facilitator passes payment scheduling information to the Market Place
27 Exchange. Transaction facilitator 120 advises Market Place Exchange when to
28 prompt buyer for payment (full transaction information is optionally located in the

1 Market Place Exchange). Buyer remits payment to transaction facilitator, or TF
2 initiates EFT according to buyer-accepted payment schedule. Transaction facilitator
3 aggregates payments from many buyers for each seller and remits funds to seller
4 with accounts receivable information. Also, the functions of the TF could be
5 combined with some or all of the roles of a Market Place Exchange, especially
6 financial roles, or vice versa. TF may only be a service provider or optionally may
7 also be a lender/credit provider.

8 Numerous variations on the above method will be understood by those skilled in the
9 art and are within the scope of the invention. For example, payment remittance
10 could pass from buyer 110 to Market Place Exchange 105 or other intermediary
11 before passing to TF 120 or could pass directly to Seller 115 where Seller is the
12 lender/credit provider.

13 FIG. 2 is an alternate entity-relationship diagram showing the key components of
14 one embodiment of the invention and their interrelationships. Fig. 2 depicts
15 substantially the same entities and relationships as in Fig. 1 except that a new entity
16 is depicted, i.e., the buyers' and/or sellers' financial institution 220. Receipt of
17 payment remittances from buyer is optionally directly from buyer's financial
18 institution, e.g., by ACH or EFT. Transfer of funds from TF 215 to seller 210 is
19 optionally made directly to seller's financial institution 220. In the TF entity 215,
20 internal processes shown include credit extension, transaction clearing, data mining,
21 accounting reporting, and terms matching. TF 215 optionally maintains its own data
22 for determining a buyer's credit score and corresponding credit options to be
23 extended to buyer 225.

24 TF 215 passes buyer registration information to seller 210 and seller passes
25 available credit terms/limits for buyer to TF. TF passes buyer registration
26 information to credit evaluator 230 (also referenced throughout as Credit Info.
27 Provider) (e.g., Experian, Dunn & Bradstreet), and receives credit score and/or other
28 financial information back from credit evaluator. An eMarket place 205 passes a
29 buyer's order information, and payment triggering dates, to TF 215. TF passes

1 buyer credit option selection and payment schedule to eMarket Place 205. There
2 are several variations on the buyer registration step and credit evaluation step, e.g.,
3 automated registration via cookies or related technologies. Also, credit evaluation
4 could involve accessing, separately or in combination, a plurality of commercial and
5 proprietary databases for credit histories. That credit information may optionally be
6 processed, separately or in combination, through a plurality of commercial and
7 proprietary credit evaluation application programs to determine the risk of lending to
8 a particular buyer.

9 FIG. 3 is a schematic block system level 0 flow chart diagram of one embodiment of
10 the invention. Buyer 305 passes registration information to the Transaction
11 Facilitation ("TF") Process 0. The TF process 0 passes this registration information
12 to Credit Information Provider 320. The Credit Info. Provider performs a credit
13 scoring process on the Registration Information together with any credit history
14 information held by the Credit Info. Provider to develop a credit score, credit profile,
15 and/or other product useful for a Credit Provider in assessing risk (individually or in
16 any combination referred to as "credit score"). The Credit Info. Provider 320 passes
17 the Buyer's credit score to the TF process 0. In the TF process, the credit score is
18 passed to one or more sellers 310. The sellers use the credit score in a credit
19 evaluation process to develop credit offerings for a buyer 305. The seller passes the
20 credit offerings for a buyer to the TF process. In the TF process, a database (or look
21 up table) is created containing all available credit offerings from all sellers
22 designated in the buyer's registration and from any third-parties.

23 Upon receiving a product/service order from a buyer, an eMarketplace will pass the
24 order with buyer's credit preferences for that order to the TF process. In the TF
25 process, a matching process occurs whereby the buyer's credit preferences are
26 compared to credit offerings available from the seller(s) and, if none or insufficient,
27 credit offerings of third-parties and/or optionally the TF are checked. One or more
28 credit offerings are then passed to the buyer 305 who selects one option and passes
29 that decision to the TF process.

1 In the TF process, the buyer's credit selection together with a corresponding
2 payment schedule is passed to the eMarketplace. The buyer remits payments or TF
3 initiates EFT draft or other payment according to the payment schedule set during
4 the ordering process. In the TF process the buyer's payment is transferred to the
5 seller if the seller extended the credit less an transaction fee, if any. Where a third-
6 party provides some or all of the credit, the TF process transfers payment to the
7 seller upon shipment of products or other designated schedule. Alternatively, third-
8 party funds are transferred to the buyer, who is the borrower, who then arranges
9 payment with the seller.

10 FIG. 4 is a schematic level 1 data flow diagram (a first decomposition of the system—
11 diagram in Fig. 3) and shows logical data flow between major processes of one
12 embodiment of the invention. Information about a Buyer, e.g., registration
13 information and credit history 405, optionally from the buyer, credit agencies, and/or
14 a plurality of other data sources passes to process 1.0, Determine Credit Rating
15 Process. There a credit rating 410 (also referred to throughout as "credit score") is
16 determined and passed to process 2.0, Determine Credit Options Process. That
17 process determines credit options 415 for a buyer and passes information about
18 those credit options 415 to process 3.0, Create database of Credit Options for Buyer
19 Process.

20
21 The time elapsed between the buyer registration step and the completion of the
22 creation of credit options database step is preferably minimal, e.g., less than 5, 3, 2,
23 or 1 minute, or more preferably in real-time. In order for the data, e.g., buyer
24 registration data, to be successfully passed between the processes, the data must
25 be in a format acceptable to the receiving process. Preferably, to facilitate
26 implementation among a large number of users, a standard format will be
27 developed, such as is possible using Extensible Markup Language, the universal
28 format for structured documents and data on the Web. Several industry-specific
29 XML standard formats already exist.

1 In an optional step in the process the TF receives data from the buyer, seller, and/or
2 eMarket Place regarding shortages, spoilages, breakages, or other problems with a
3 received order. The TF processes this data in an order/invoice adjustment process
4 to produce a revised order, payment terms statement to send the eMarket Place,
5 buyer, and/or seller.

6 A structured database, typically using the relational model, is created using
7 conventional tools, e.g., a relational database management system ("RDBMS"). A
8 buyer's order 420 is based to process 4.0, Query Database for each Order of Buyer
9 Process. Optionally, using conventional searching technology commonly provided
10 with commercial RDBMS' or proprietary technology, the database is queried to
11 determine available credit options for the buyer for the particular order. A report 425
12 is created of those options and passed to process 5.0, Buyer Selects Credit Option
13 Process. The time elapsed between the order step and the completion of the credit
14 options search step is preferably minimal, e.g., less than 5, 3, 2, or 1 minute, or
15 more preferably in real-time. The buyer's selection 430 is passed to process 6.0,
16 Fulfill Order and Collect Payment Per Terms of Credit Option Selection Process.

17 Fig. 5 is an example in one embodiment of relations for use in a credit option
18 database. The Buyer relation 510 in one embodiment contains the following
19 attributes: Buyer ID, Name, Contact Info., Credit Score, and Credit terms ID(s). The
20 Seller relation 520 in one embodiment contains the following attributes: Seller ID,
21 Name, Contact Info., and Credit Provider ID . The Credit Provider relation 530 in one
22 embodiment contains the following attributes: Credit Provider ID, Name, Contact
23 Info., and Approved Buyer ID(s). The Credit Terms relation 515 in one embodiment
24 contains the following attributes: Credit Terms ID, Limit, Payment Schedule,
25 Interest, Penalties, and Credit Provider ID. The Order relation 525 contains the
26 following attributes: Order ID, Buyer ID, Seller ID, Product ID(s), Credit terms ID,
27 Credit Provider ID, and Quantity. The Products relation 535 in one embodiment
28 contains the following attributes: Product ID, Seller ID(s) and Product Description.
29 Selection of attributes, attribute domains, keys and foreign keys, and normalization

1 of relations sufficient to enable a database for determining available credit options
2 for a particular buyer, having particular credit preferences, in a particular order, and
3 from particular sellers is within the normal skill of one schooled in the database arts.

4 A seller's or other credit provider's credit offerings may vary depending on many
5 factors, e.g., financial condition, economy, inventory, accounts receivables, buyer's
6 status or order details, or other factors. Thus, in one embodiment of the invention
7 the database is updated at regular intervals or upon some triggering event, e.g.,
8 based on size of an order, lapsed time from most recent order, or upon seller's
9 request. As a result the credit score or evaluation of a buyer, the credit offerings of a
10 seller or credit-provider, and the credit offerings for a given order will be updated
11 continually or on a flexible schedule as needed.

12 Fig. 6A,B illustrates in one embodiment sample SQL-type database queries for
13 matching credit options for a buyer. Figure 6A depicts an exemplary SQL-type
14 query where each seller's credit options for a buyer are stored in separate Seller
15 relations. Figure 6B depicts an exemplary SQL-type query where all credit options
16 from all sellers and third-parties for all buyers are stored in separate Credit Terms
17 relations. Persons skilled in the database arts know various alternative queries
18 appropriate for a variety of database structures sufficient to return all credit options
19 for a particular buyer.

20 Figs. 7-9 depicts in one embodiment various schematic diagrams of the exemplary
21 logical process involved in credit matching for various scenarios. With reference to
22 Fig. 7, in this example, seller requirements 705 for cash settlement are transferred to
23 TF and matched against credit requirements 710 as outlined by the buyer. In this
24 case, a match is made for "EFT" settlement at 10 days following delivery. Dates of
25 delivery and receipt are fed from the market exchange and TF executes the
26 transaction on the appropriate date.

27 With reference to Fig. 8, in this example, seller requirements 805 for cash settlement
28 are transferred to TF and matched against credit requirements 810 as outlined by

1 the buyer. In this case, there is no match between buyer and seller. The exchange
2 steps in with its credit offerings 815 to facilitate the transaction accepting the buyers
3 desired used of a 3rd party bankcard on behalf of the seller. Cost of the interchange
4 fee can be passed (or not passed) on from the seller to the buyer in the form of a
5 handling or other transaction fees. Dates of delivery and receipt are fed from the
6 market exchange and Riverpool executes the transaction on the appropriate date.

7 With reference to Fig. 9, in this example, seller requirements 905 for cash settlement
8 are transferred to TF and matched against credit requirements 910 as outlined by
9 the buyer. In this case, Seller wants good funds 10 days after delivery and buyer
10 wants credit for 30 days. The eMarket Exchange (also referenced throughout as
11 eMarket Place) or TF steps in with its credit offerings 915 to provide credit for 20 days
12 to buyer at appropriate "pricing" based on risk assessment. Dates of delivery and
13 receipt are fed from the eMarket exchange and TF executes the transaction on the
14 appropriate dates.

15 The web site for the system includes conventional web site development
16 considerations known to experienced web site developers. Such considerations
17 include content, content clearing, presentation of content, architecture, database
18 linking, external web site linking, number of pages, overall size and storage
19 requirements, maintainability, access speed, use of graphics, choice of metatags to
20 facilitate hits, privacy considerations, and disclaimers.

21 Optionally, a test environment is used prior to deployment of the production system.
22 In the test environment, the web site is loaded into an isolated test environment for
23 debugging and for other test purposes. A piloting step is also optionally utilized (it
24 may also be called an alpha and/or beta testing step/means. In the pilot step, the
25 system is internally test marketed. The piloting step/means optionally includes
26 formally or informally gathering feedback from the internal users of the web site for
27 use in improving and debugging the site and for use in planning the marketing step.